UNITED STATES PATENT AND TRADEMARK OFFICE

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EXAMINER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

Office Action Summary	Application No.	Applicant(s)
	10/573,881	LESCOUET ET AL.
	Examiner	Art Unit
	ABDULLAH AL KAWSAR	2195

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 March 2006*.
2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *1-36* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.
10)☒ The drawing(s) filed on *29 March 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a)☒ All   b)☐ Some *   c)☐ None of:
      1.☒ Certified copies of the priority documents have been received.
      2.☐ Certified copies of the priority documents have been received in Application No. _____.
      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/11/207*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1.   Claims 1-36 are pending.

Drawings

2.   The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description:

      i.   2012 on page 13, line 1;

      ii.   2014 on page 13, line 16 and 18;

      iii.   2022 on page 14, line 2;

      iv.   2028 on page 14, line 3;

      v.   2028 on page 15, line 7;

      vi.   2024 on page 14, line 12;

      vii.   2026 on page 14, line 15;

      viii.   2026 on page 17, line 18;

      ix.   207 on page 15, line 12;

      x.   403 on page 15, line 21; and

      xi.   101 on page 26, line 27.

3.   The drawings are objected to because the drawing figure 9a, 9b, 10, 11 are not clear to understand the elements of the drawings.

4.   Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing

sheet should include all of the figures appearing on the immediate prior version of the sheet,

even if only one figure is being amended. Each drawing sheet submitted after the filing date of

an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet"

pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will

be notified and informed of any required corrective action in the next Office action. The

objection to the drawings will not be held in abeyance.

Specification

5.   The disclosure is objected to because of the following informalities: please update the

status of the priority application with the updated status of the application (patent/publication

no). Appropriate correction is required.

6.   The disclosure is objected to because of the following informalities: the examiner notes

the use of acronyms (e.g. IDE, SCSI, etc.) throughout the specification without first including a

description in plain text, as required.

7.   The disclosure is objected to because it contains an embedded hyperlink and/or other

form of browser-executable code. Applicant is required to delete the embedded hyperlink and/or

other form of browser-executable code. See MPEP § 608.01.

Claim Objections

8.   Claim 33 is objected to because of the following informalities:

     a.   Claim 33, line 2, please replace ";" with ":".

    Appropriate correction is required.

Double Patenting

9.   A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

    A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer <u>cannot</u> overcome a double patenting rejection based upon 35 U.S.C. 101.

10.   Claims 1, 10-19, 21-23, 26-30, 33-34 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1-11, 13-15, 20-21, 25, 28-31 of copending Application No.10/552,608. This is a statutory <u>provisional</u> double patenting rejection since the conflicting claims have not in fact been patented.

11.   Claims 1, 10-15, 18, 19, 21, 22, 26, 27, 30, 33 and 34 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1, 12-17, 20-24, 26-28, 30 and 31 of copending Application No.10/573,918. This is a statutory <u>provisional</u> double patenting rejection since the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 101

12.   35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

13.   Claims 30 and 31 are rejected under 35 U.S.C. 101 because the claimed invention is

directed to non-statutory subject matter.

14.   Claims 30 and 31 are directed to program product comprising code for performing

method functions without being stored on any storage medium. Therefore the claims are non-

statutory. Applicant is suggested to amend the claims to include storage medium for storing the

code and executing the code with a processor to perform the method functions. Appropriate

correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

15.   Claims 35 and 36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite

for failing to particularly point out and distinctly claim the subject matter which applicant

regards as the invention.

        a.   The following claim languages are unclear and indefinite:

                i.   As per claim 35, line 1, 3 recites "operable" the claim language "operable"

                is indefinite and does not mandate the software to run in real mode.

ii.   Claim 36, line 1 recites "the system, product or method of claim 1" it is

unclear if the claim is a system, product or method claim as the independent claim

is a method claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed
> in the United States before the invention by the applicant for patent or (2) a patent granted on an application for
> patent by another filed in the United States before the invention by the applicant for patent, except that an
> international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this
> subsection of an application filed in the United States only if the international application designated the United
> States and was published under Article 21(2) of such treaty in the English language.

16.   Claims 1-5, 9-20, 23, 25-35 are rejected under 35 U.S.C. 102(e) as being anticipated by

Ohno et al.(US Patent No. 6,715, 016).

17.   As per claim 1, Ohno teaches the invention as claimed including a method of enabling

multiple different operating systems to run concurrently on the same computer (figure 1),

comprising:

selecting a first operating system to have a relatively high priority (col 3, lines 53-55;);

selecting at least one second operating system to have a relatively lower priority (col 3,

lines 39-42; lines 53-57);

providing a common program arranged to switch between said operating systems under

predetermined conditions (col 3, lines 59-65); and

providing modifications to said first and second operating systems to allow them to be

controlled by said common program (col 1, lines 64-67 through col 2, lines 1-19).

18.   As per claim 2, Ohno teaches wherein the first and second operating systems are

associated with first and second memory contexts, respectively, and the common program is

associated with a third memory context, the method comprising switching a current memory

context to the first, second or third memory context when switching between said operating

systems (figure 2).

19.   As per claim 3, Ohno teaches switching the current memory context to the first memory

context when switching to or from the first operating system (col 8, lines 20-39; switching to

OS-A by switching the memory space to load the context of OS-A from the memory space of

OS-A).

20.   As per claim 4, Ohno teaches invoking the common program by the first operating

system, and starting execution of the common program in the first memory context (col 6, lines

35-40; the common program is running as device driver of OS-A therefore its running on the

context of OS-A).

21.   As per claim 5, Ohno teaches preempting the first operating system by the common

program, and starting execution of the common program in the first memory context (col 6, lines

35-40; lines 53-56).

22.   As per claim 9, Ohno teaches wherein the second operating system invokes the common

program by a trap call (col 3, lines 59-67 through col 4, lines 1-2).

23.   As per claim 10, Ohno teaches in which the first operating system is a real time operating

system (col 3, lines 53-55).

24.   As per claim 11, Ohno teaches in which the second operating system is a non-real time,

general-purpose operating system (col 3, lines 39-42).

25.   As per claim 12, Ohno teaches in which the second operating system is Linux, or a

version or variant thereof (col 3, lines 39-42).

26.   As per claim 13, Ohno teaches in which the common program is arranged to save, and to

restore from a saved version, the processor state required to switch between the operating

systems (col 2, lines 4-11).

27.   As per claim 14, Ohno teaches in which processor exceptions for the second operating

system are handled in virtual fashion by the common program (col 8, lines 41-45).

28.   As per claim 15, Ohno teaches in which the common program is arranged to intercept

some processor exceptions, and to call exception handling routines of the first operating system

to service them (col 7, lines 21-41).

29.   As per claim 16, Ohno teaches in which the processor exceptions for the second

operating system are notified as virtual exceptions (col 8, lines 33-49).

30.   As per claim 17, Ohno teaches in which the common program is arranged to call an

exception handling routine of the second operating system corresponding to a said virtual

exception which is pending (col 8, lines 33-49).

31.   As per claim 18, Ohno teaches further comprising providing each of said operating

systems with separate memory spaces in which each can exclusively operate (col 4, lines 65-67

through col 5, lines 1-2).

32.   As per claim 19, Ohno teaches further comprising providing each of said operating

systems with first input and/or output devices of said computer to which each has exclusive

access (col 3, lines 24-28; col 4, lines 38-46).

33.   As per claim 20, Ohno teaches in which each operating system accesses said first input

and/or output devices using substantially modified native routines (col 4, lines 58-64).

34.   As per claim 23, Ohno teaches providing a restart routine for restarting a said second

operating systems without interrupting operation of said first, or said common program (col 2,

lines 4-11).

35.   As per claim 25, Ohno teaches in which one or more original address tables are provided

by the computer for use by an operating system, and in which the common program accesses

said original address tables, and provides a plurality of replicated tables having the same

structure as said original tables, elsewhere in memory, one per table per operating system, each

for use by a respective operating system, and in which said operating systems are modified so as

to replace instructions which write said original address tables with routine calls which access

said replicated tables (col 5, lines 5-62).

36.   As per claim 26, Ohno teaches combining said operating systems and common program

into a single code product (col 1, lines 64-67 through col 2, lines 1-4).

37.   As per claim 27, Ohno teaches embedding said operating systems and common program

onto persistent memory on a computer product (col 2, lines 20-23).

38.   As per claim 28, Ohno teaches in which each said operating system is provided with an

idle routine, in which it passes control to the common program (col 3, lines 59-67 through col 4,

lines 1-14).

39.   As per claim 29, Ohno teaches in which said idle routine substitutes for a processor halt

instruction (col 3, lines 59-67 through col 4, lines 1-14).

40.   As per claim 30, Ohno teaches a development kit computer program product comprising

code for performing the steps of claim 1 (col 2, lines 20-23).

41.   As per claim 31, Ohno teaches a computer program product comprising code combined

according to claim 20 (col 1, lines 64-67 through col 2, lines 1-4).

42.   As per claim 32, Ohno teaches an embedded computer system comprising a CPU,

memory devices and input/output devices, having stored on persistent memory therein programs

embedded according to claim 31 (col 2, lines 57-65).

43.   As per claim 33, Ohno teaches the invention as claimed including a computer system

comprising a CPU, memory devices and input/output devices (col 2, lines 57-65; figure 1),

having executing thereon computer code comprising;

        a first operating system having a relatively high priority (col 3, lines 53-55);

        a second operating system having a relatively lower priority (col 3, lines 39-42; lines 53-

57); and

        a common program arranged to run said operating systems concurrently by switching

between said operating systems under predetermined conditions (col 3, lines 59-65).

44.   As per claim 34, Ohno teaches a computer system according to claim 28, arranged to run

said first and second operating systems concurrently (col 3, lines 39-52).

45.   As per claim 35, Ohno teaches the invention as claimed including a computer system

comprising a processor and a memory and operable to execute thereon computer code to operate

first and second operating systems in first and second memory contexts, respectively, and a

common program operable in said first or a third memory context to switch between the first and

second operating systems(figure 1 and figure 2; col 5, lines 5-62), wherein the memory context

in which the common program is operated depends on the switching operation (col 4, lines 3-14;

common program executes as a embedded driver of the OS therefore it is executing in the

context of the OS).

Claim Rejections - 35 USC § 103

46.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

47.   Claims 6-8 and 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Ohno et al.(US Patent No. 6,715,016), in view of Endo et al.(US Patent No. 6,615,303).

48.   As per claim 6, Ohno do not specifically disclose switching the current memory context

to the third memory context when switching from the second operating system.

        However Endo teaches switching the current memory context to the third memory

context when switching from the second operating system (col 9, 24-39; figure 1; switching to

the inter OS control function when switching the operating system).

49.   It would have been obvious to a person of ordinary skill in art at the time of invention

was made to incorporate the teaching of Endo into the method of Ohno to have switching from

the current memory context to the third memory context. The modification would have been

obvious because one of the ordinary skills of the art would be motivated to utilize the teaching of

Endo to switch to a different memory context when switching between the operating system as

the common software is in the third memory context and in control of the switching of the

operating system.

50.   As per claim 7, Endo teaches invoking the common program by the second operating

system, wherein the current memory context is the third memory context (figure 1; col 9, lines

46-67; switching to the inter OS control function(third memory context) when OS switch is

required).

51.   As per claim 8, Endo teaches preempting the second operating system by the common

program, wherein the current memory context is the third memory context (figure 1; col 9, lines

46-67; switching to the inter OS control function(third memory context) when OS switch is

required).

52.   As per claim 21, Ohno do not specifically disclose providing each of said operating

systems with access to second input and/or output devices of said computer to which each has

shared access (figure 11, element 192; col 6, lines 36-37).

However Endo teaches providing each of said operating systems with access to second input and/or output devices of said computer to which each has shared access (figure 11, element 192).

53.   As per claim 22, Endo teaches in which all operating systems access said second input and/or output devices using the routines of the first operating system (col 12, lines 63-67).

54.   Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohno et al.(US Patent No. 6,715,016), in view of Kahle et al.(US Patent No. 5,812,823).

55.   As per claim 36, Ohno does not specifically disclose in which the computer has a Complex Instruction Set architecture.

However Kahle teaches in which the computer has a Complex Instruction Set architecture (col 2, lines 54-67 through col 3, lines 1-3).

56.   It would have been obvious to a person of ordinary skill in art at the time of invention was made to incorporate the teaching of Kahle into the method of Ohno to have complex instruction set architecture. The modification would have been obvious because one of the ordinary skills of the art would be motivated to utilize the teaching of Kahle to have a complex instruction set architecture for performing the execution on a x86 based machine as it is very common and widely used.

57.   Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohno et al.(US

Patent No. 6,715,016), in view of Endo et al.(US Patent No. 6,615,303), in view of Songer et al.

(US Patent No. 6,763,327).

58.   As per claim 24, Ohno and Endo do not specifically disclose in which said second device

comprises a co-processor, and in which, on switching between said first operating system and

said second (or vice versa), the state of said co-processor is not changed, whereby if said

operating systems switch back without intervening access to said coprocessor, its operation can

complete uninterrupted.

        However Songer teaches said second device comprises a co-processor, and in which, on

switching between said first operating system and said second (or vice versa), the state of said

co-processor is not changed, whereby if said operating systems switch back without intervening

access to said coprocessor, its operation can complete uninterrupted (col 13, lines 28-67 through

col 14, lines 1-57).

59.   It would have been obvious to a person of ordinary skill in art at the time of invention

was made to incorporate the teaching of Songer into the combined method of Endo and Ohno to

have switching between the operating systems without changing the state of the co-processor.

The modification would have been obvious because one of the ordinary skills of the art would be

motivated to utilize the teaching of Songer to have lazy switching without interrupting the state

of a co-processor unless it is necessary to have faster and efficient context switching without

redundant operation.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ABDULLAH AL KAWSAR whose telephone number is (571)270-3169. The examiner can normally be reached on Monday to Thursday between 8:00am to 6:00pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng Ai T. An can be reached on 571-272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Li B. Zhen/   /Abdullah-Al Kawsar/
Primary Examiner, Art Unit 2194   Examiner, Art Unit 2195